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APPLICATION NUMBER: 60/480,972

FILING DATE: June 24, 2003

RELATED PCT APPLICATION NUMBER: PCT/US04/20124

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60/480972

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 Additional inventors are being named on the \_\_\_\_\_ separately numbered sheets attached hereto

## TITLE OF THE INVENTION (500 characters max)

HOUSED BUSH ROLLER

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## ENCLOSED APPLICATION PARTS (check all that apply)

<input checked="" type="checkbox"/> Specification Number of Pages	3	<input type="checkbox"/> CD(s), Number	<input type="text"/>
<input checked="" type="checkbox"/> Drawing(s) Number of Sheets	3	<input type="checkbox"/> Other (specify)	<input type="text"/>
<input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76			

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160

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

 No. Yes, the name of the U.S. Government agency and the Government contract number are: \_\_\_\_\_.

[Page 1 of 2]

Respectfully submitted,

SIGNATURE 

Date

6/24/03

TYPED or PRINTED NAME

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(if appropriate)

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*Additional Page*

PTO/SB/16 (05-03)

Approved for use through 4/30/2003. OMB 0651-0032  
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Serial No.: Unassigned

Date Filed: Herewith

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Catherine A. Johnson  
Catherine A. Johnson

*Provisional Application*

HOUSED BUSH ROLLER

FIELD OF THE INVENTION:

[0001] This invention relates to rollers for load-bearing roller applications. More particularly this invention relates to a bearing with a metal-polymer bush for sliding or rolling load-bearing roller applications.

BACKGROUND OF THE INVENTION:

[0002] Currently, roller bearings are used in a variety of applications where the bearing must support a load. One example of such an application is in automotive sliding doors, for example in a minivan. The current configuration comprises the apparatus shown in FIG. 1. This apparatus comprises an arm fixed to the sliding door. At the free end of the arm is a sliding chariot comprising two guide rollers with a support roller therebetween. The support roller comprises an over-molded ball bearing attached to the arm by a pin. The support roller carries the weight of the door while the guide rollers run through a tubular channel to guide the door during its movement.

[0003] The over-molded ball bearing is expensive for such an application and is susceptible to corrosion. Once the ball bearing begins to corrode, it can no longer adequately support the weight of the door. As the corrosion progresses, the ball bearing will eventually erode and fail. The weight of the door will then rest on the guide rollers which are not designed to carry such a load. This will eventually lead to damage to the door and/or doorframe.

[0004] It is, therefore, desirable to have a low-cost non-corrosive bearing for use in load-bearing operations. It is to these perceived needs that the present invention is directed.

BRIEF DESCRIPTION OF THE DRAWINGS:

[0005] FIG. 1 is a photograph of a prior art drawer slide assembly currently in use employing an over-molded ball bearing.

[0006] FIG. 2 is a schematic drawing of the bush and roller configuration of an embodiment of the present invention.

[0007] FIG. 3 is a photograph of the housed bush roller of an embodiment of the present invention mounted on a drawer slide.

SUMMARY OF THE INVENTION:

[0008] In a first aspect of the present invention a supporting roller assembly is provided comprising a housed bush roller. The housed bush roller comprises a metal-polymer bush mounted in a plastic roller.

[0009] One embodiment of the present invention is depicted in FIG. 2. A roller surrounds the metal-polymer bush, which in turn rotatably surrounds the pin. The roller preferably comprises a plastic material such as those currently in use in ball bearing roller applications. The bush is molded or mounted in the roller so as to secure the bush to the roller.

[0010] In one embodiment of the present invention, the bush is flanged at at least one end and preferably at both ends so as to provide contact surfaces for the pin at the ends of the roller.

[0011] The pin preferably comprises an enlarged head and is securely held within the bush by a washer. The enlarged head and rear washer keep the roller and bush from moving axially along the pin yet provide contact surfaces to allow the roller to turn freely around the pin.

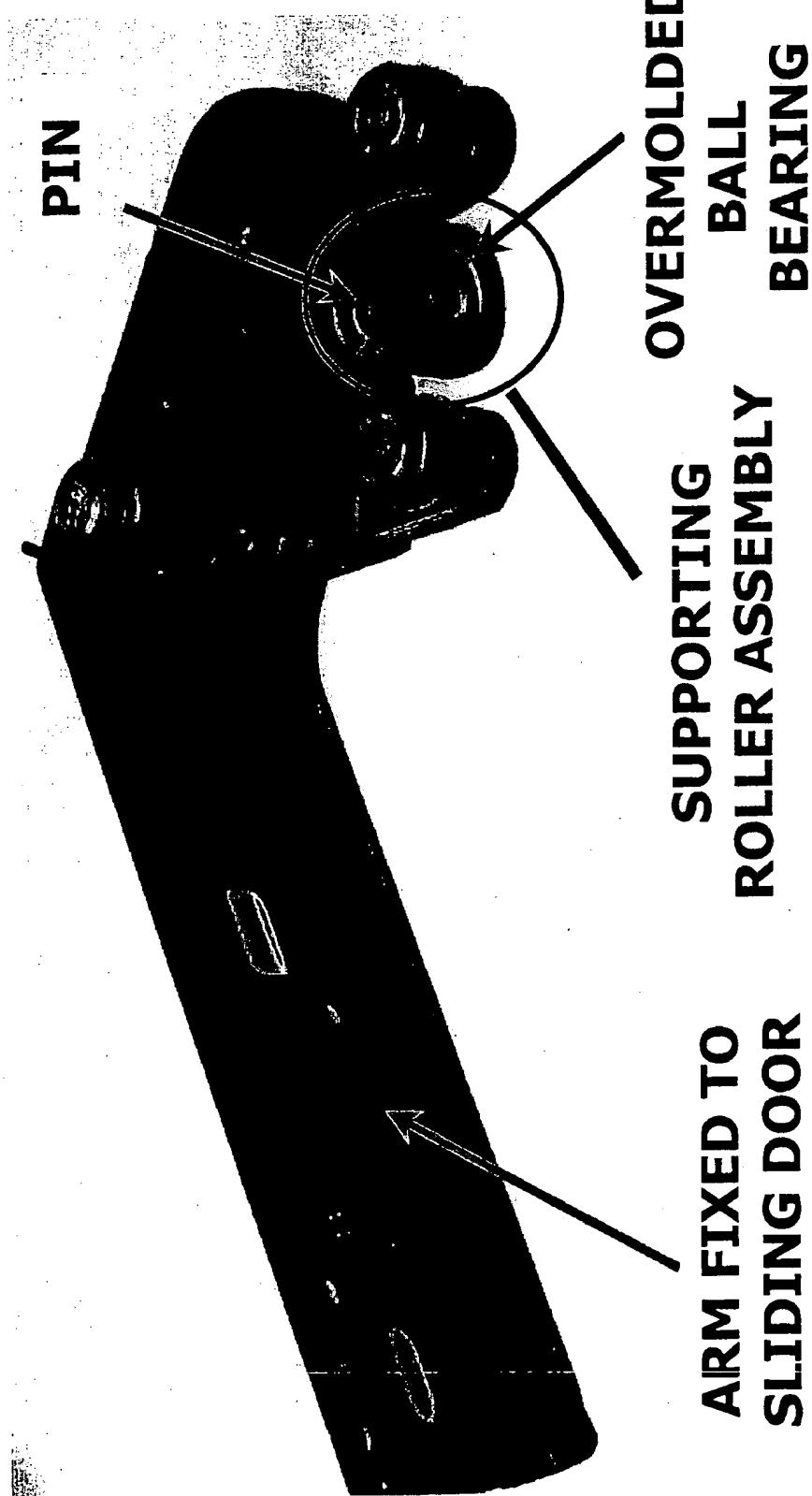
[0012] The metal-polymer bush is manufactured from a metal-polymer bush material as is known in the art. A preferred material comprises DU B manufactured by Glacier Garlock Bearings, Inc. DU B is a PTFE/Lead bearing material on a bronze backing. This material provides optimal anti-friction properties and corrosion resistance at a lower cost than traditional ball bearings. Other common non-corrosive metal-polymer bearing materials as are known in the art are also acceptable for use in the present invention.

[0013] FIG. 3 depicts one embodiment of the present invention in a sliding door assembly. The housed bush roller is mounted to a sliding chariot pivotally mounted to an arm which is attached to a sliding door, for example on an automobile. The housed bush roller replaced the ball bearing roller discussed in the Background section. The remainder of the sliding chariot assembly remains unchanged. This allows the housed bush roller to be integrated into existing products with a minimum of retooling.

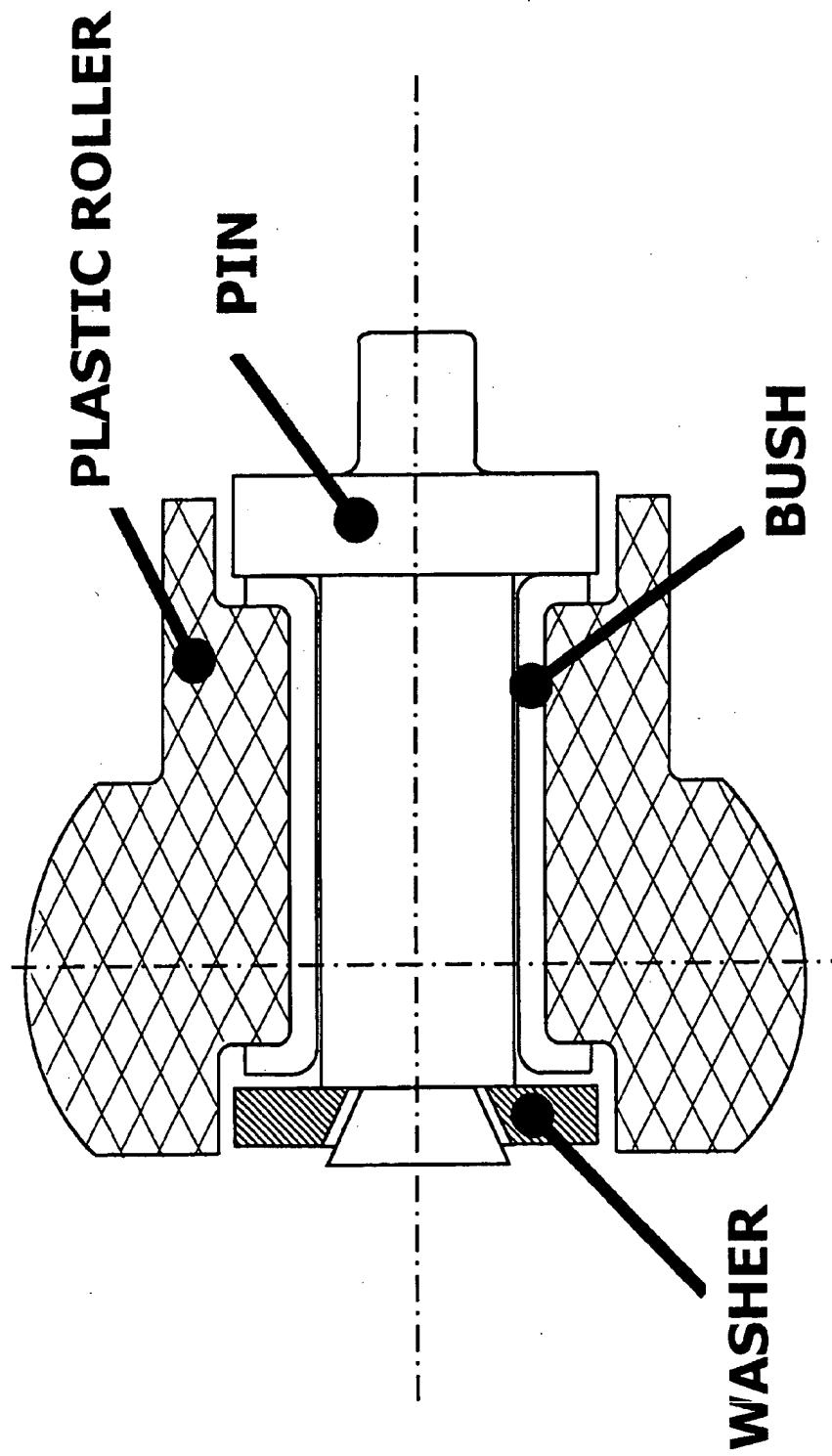
[0014] In this configuration, the housed bush roller supports the weight of the door and provides a nearly frictionless sliding surface between the pin and the bush.

[0015] While a preferred application of the present invention in a sliding automobile door has been described herein, other load-bearing applications are within the scope of the present invention. For example, the housed bush roller of the various embodiments of the present invention may be used in conjunction with other sliding door applications, lifting equipment, handling equipment, or any traditional roller bearing application where the bearing must carry a load.

[0016] Various embodiments of the invention have been described in fulfillment of the various objects of the invention. It should be recognized that these embodiments are merely illustrative of the principles of the present invention. Numerous modifications and adaptations thereof will be readily apparent to those skilled in the art without departing from the spirit and scope of the present invention.



**FIG. 1**



**FIG. 2**

EXPRESS MAIL NO. EV032107913US

**HOUSED BUSH  
ROLLER**

**FIG. 3**

